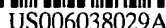


	Type	Hits	Search Text
1	BRS	4	"6111634"
2	BRS	123391	wafer
3	BRS	12856	wafer and image and edge
4	BRS	7708	(wafer and image and edge) and (orient\$5 or rotat\$3)
5	BRS	2018	((wafer and image and edge) and (orient\$5 or rotat\$3)) and window
6	BRS	572	((wafer and image and edge) and (orient\$5 or rotat\$3)) and window) and (film with thickness)

	Type	L #	Hits	Search Text
1	BRS	L1	962	wafer and aligning.ab.
2	BRS	L4	101	1 and edge.ab.
3	BRS	L7	11	4 and 356/399-401.ccls.
4	BRS	L10	16	4907035.URPN.
5	BRS	L11	77	356/399-401.ccls. and wafer and edge.ab.
6	BRS	L17	32	11 and (window or cmp)
7	BRS	L20	160	356/\$.ccls. and "vacuum chamber" and alignment
8	BRS	L23	79	20 and wafer
9	BRS	L26	32	23 and window



[11] Patent Number: 6,038,029

[45] **Date of Patent:** Mar. 14, 2000

- | | | | |
|-----------|---------|----------------------|------------|
| 5,166,752 | 11/1992 | Spanier et al. | 356/369 |
| 5,181,080 | 1/1993 | Anton et al. | 356/381 |
| 5,274,575 | 12/1993 | Abe | 364/559 |
| 5,333,052 | 7/1994 | Finarov | 356/369 |
| 5,420,680 | 5/1995 | Isobe et al. | 356/128 |
| 5,438,209 | 8/1995 | Yamamoto et al. | 250/559,29 |
| 5,438,413 | 8/1995 | Mazor et al. | 356/363 |
| 5,604,344 | 2/1997 | Finarov | 250/201,3 |
| 5,682,242 | 10/1997 | Eylon | 356/401 |
| 5,825,913 | 10/1998 | Rostami et al. | 382/151 |

FOREIGN PATENT DOCUMENTS

0558 781 A1	9/1993	European Pat. Off. .
59-125009	7/1984	Japan .
01 054 207	6/1989	Japan .

OTHER PUBLICATIONS

Ausschnitt, C.P., and Lagus, M.E., "Seeing the forest for the trees: a new approach to CD control," SPIE, vol. 3332, pp. 212-220 (1998).

Equipe Technologies, DBM 2400 Series Dual-Arm Robots for 300mm Wafers-Technical Literature (1 page).

Cybec Systems, Per4Mer 6100 Robot-Technical Literature, Sep. 1998 (1 page).

Primary Examiner—Frank G. Font
Assistant Examiner—Tu T. Nguyen
Attorney, Agent, or Firm—Skjerven, Morrill, MacPherson,
Franklin & Friel LLP

[57] **ABSTRACT**

A semiconductor production tool which provides alignment of a wafer at a fab station thereof includes an optical system, a wafer translation mechanism, a field of view translation unit and a unit for determining alignment. The optical system has a field of view which views the wafer. The wafer translation mechanism at least brings the wafer to a predetermined measurement location. In the present invention, the field of view translation unit translates the field of view relative to the wafer so as to view at least a portion of an edge of the wafer during an alignment operation. The unit for determining alignment is operative during the alignment operation and determines the alignment of the wafer from images produced by the optical system when the optical system views at least a portion of the marker.

15 Claims, 8 Drawing Sheets

windward / chamber
with
known
9/50 corner. 2511
6,181, 427
col 258-2

U.S. PATENT DOCUMENTS

4,308,586	12/1981	Coates	364/525
4,328,553	5/1982	Fredriksen et al.	364/559
4,475,122	10/1984	Green	358/101
4,516,855	5/1985	Korth	356/367
4,555,767	11/1985	Case et al.	364/563
4,585,348	4/1986	Chastang et al.	356/369
4,618,262	10/1986	Maydan et al.	356/357
4,647,207	3/1987	Bjork et al.	356/369
4,653,924	3/1987	Itonaga et al.	356/369
4,681,450	7/1987	Azzam	356/367
4,713,140	12/1987	Tien	156/626
4,815,856	3/1989	Bruce	356/357
4,826,321	5/1989	Coates et al.	356/351
4,842,410	6/1989	Darrah et al.	356/357
4,873,430	10/1989	Juliana et al.	250/225
4,908,508	3/1990	Dubbeldam	250/225
4,910,549	3/1990	Sugita	355/53
4,957,368	9/1990	Smith	356/369
4,974,919	12/1990	Muraki et al.	350/6.6
4,999,014	3/1991	Gold et al.	356/382
5,042,951	8/1991	Gold et al.	356/369
5,061,072	10/1991	Folkard et al.	356/369
5,109,430	4/1992	Nishihara et al.	382/8
5,120,966	6/1992	Kondo	250/372
5,159,412	10/1992	Willenborg et al.	356/445